

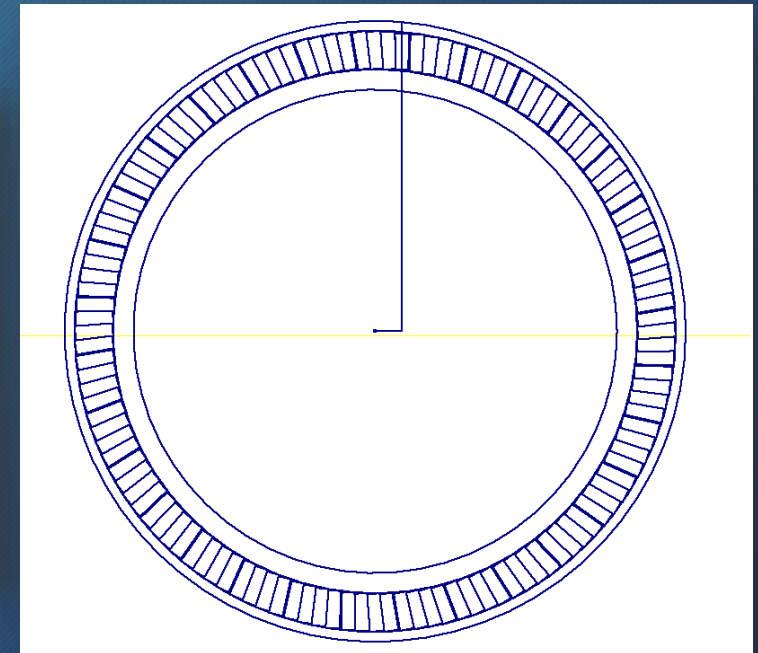
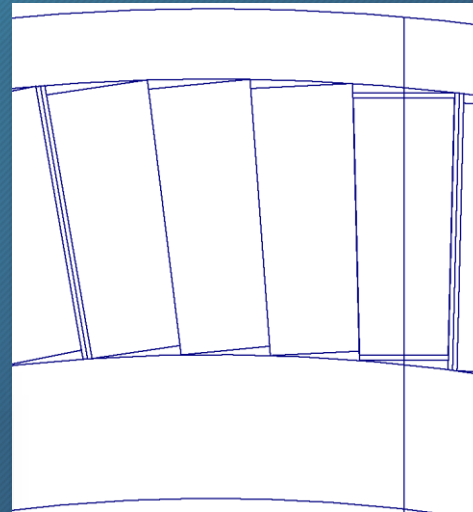
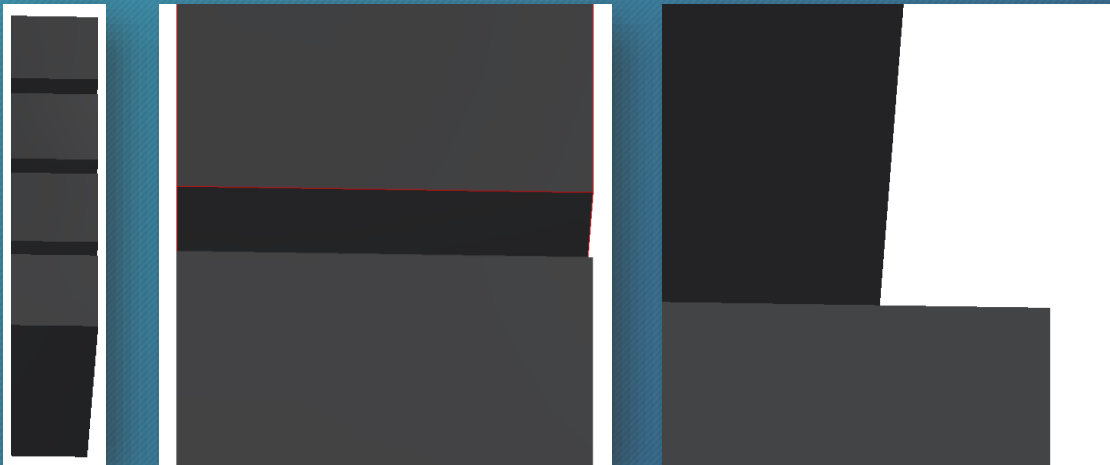
New EMCal Block, Screen and Light Guide Design

Dan Cacace

EMCal Block Design Change

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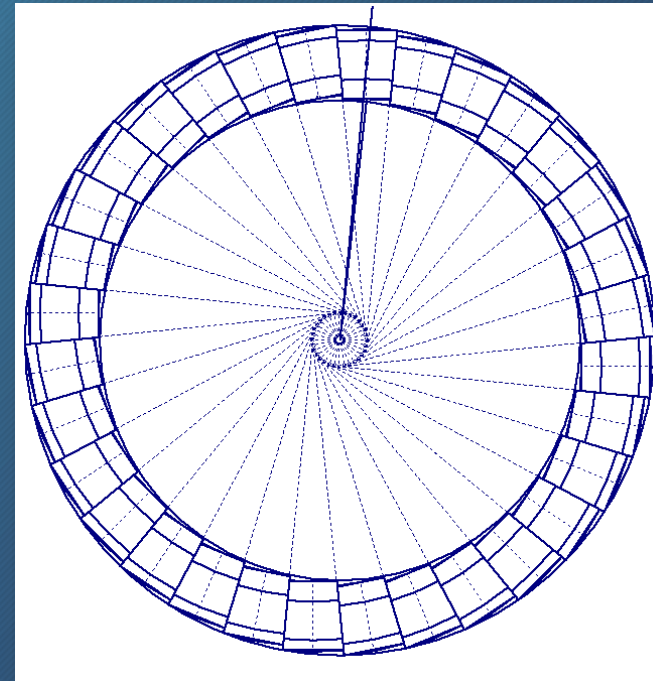
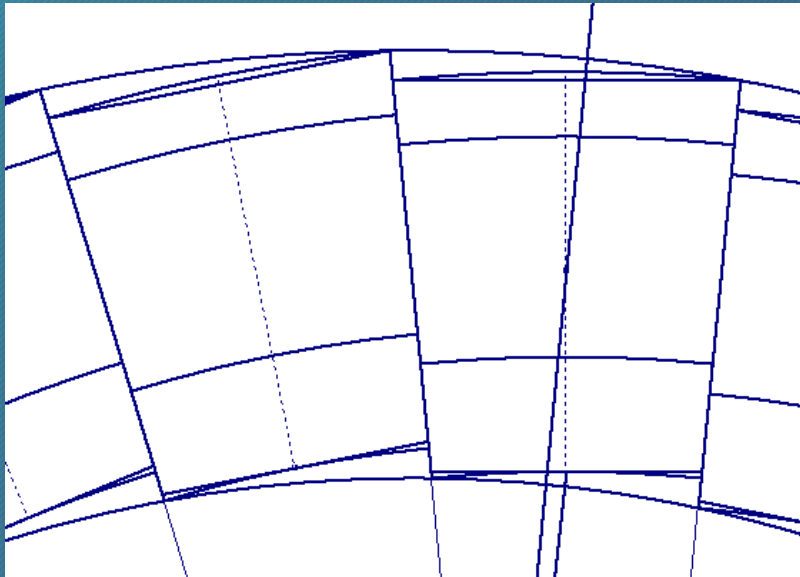
- Tilt blocks such that the focal point is 100 mm radially from central axis.
- 2 different (mirrored) sheet metal boxes needed.
- Adds another taper to blocks.



EMCal Sheet Metal Box Tilt

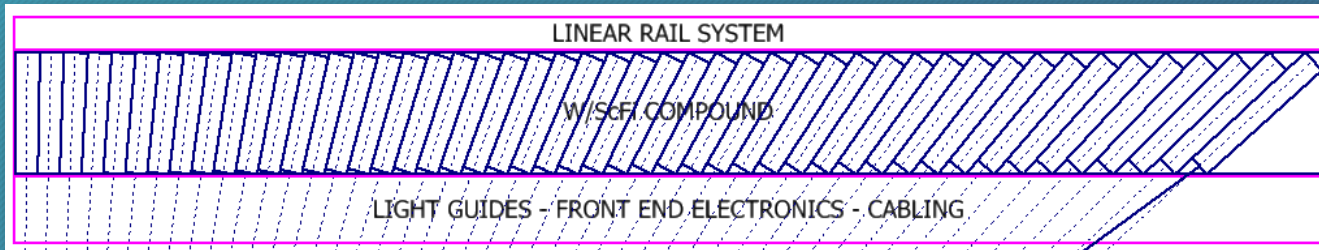
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- Tilt sheet metal box to accomplish the same thing.
- No block change.
- Outer diameter grows 1.1 in (8.5 mm).
- Inner diameter shrinks 0.33 in (28 mm).

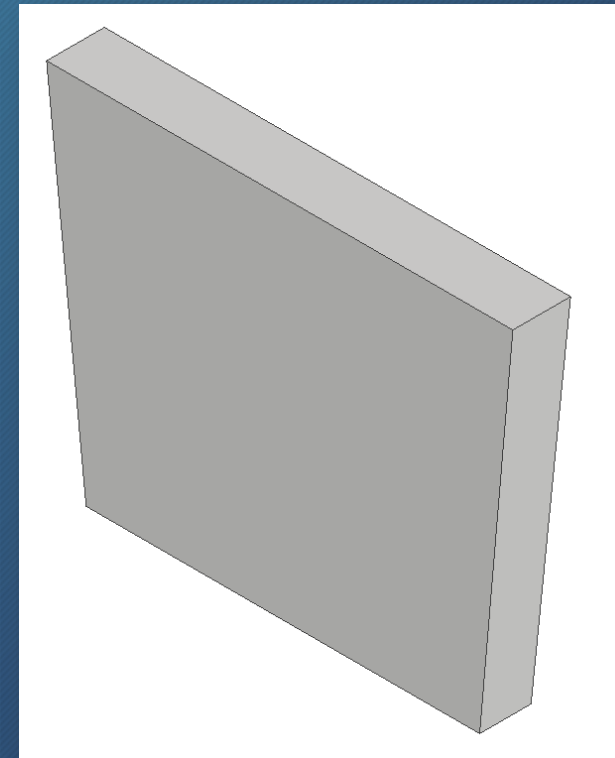


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EMCal New “Block” Design



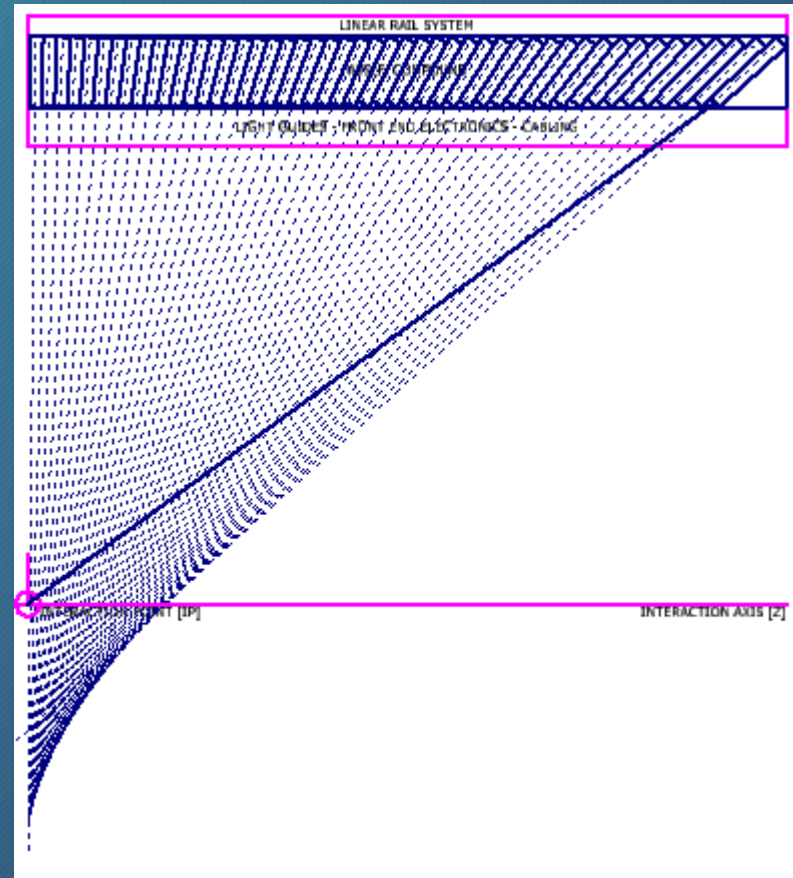
- 1X8 “Blocks” instead of 2X2 Blocks
- 48 Different “Blocks”, but one cast shape.
- Constrained the bottom length to have the same value.
- Constrained the angle between the front and the back planes to have the same value.



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EMCal “Blocks” Focus

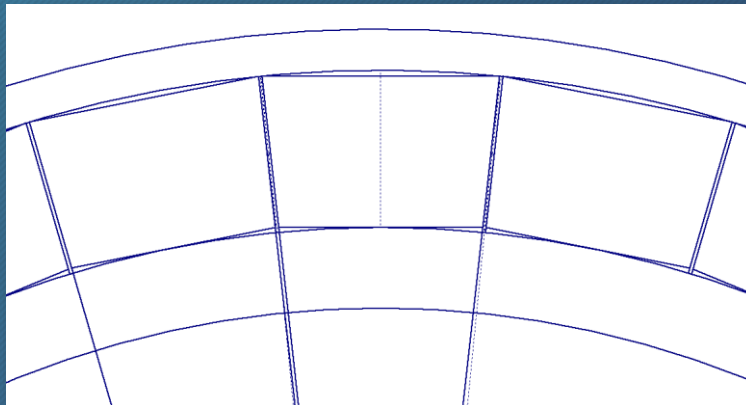
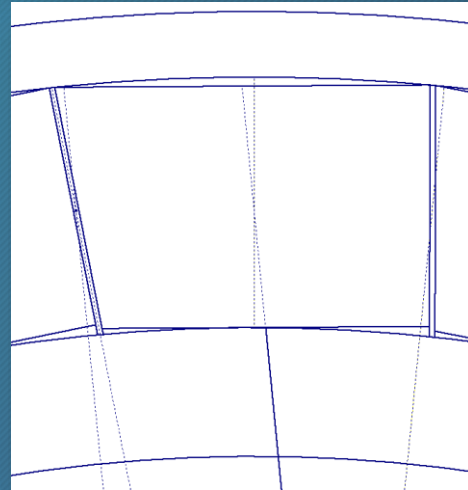
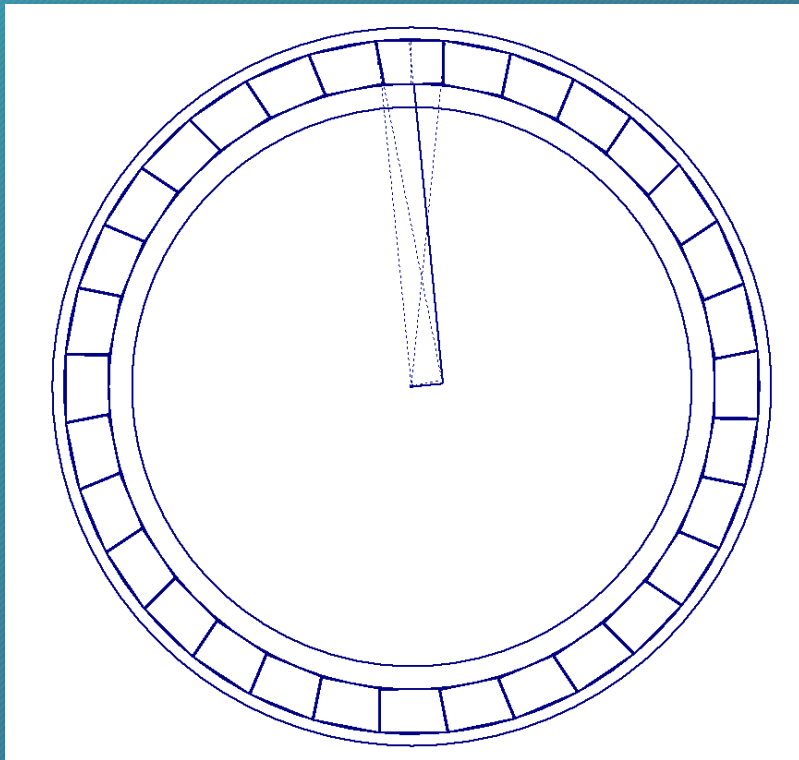
- No singular focal point.
- Can change location of focal regen.
- Currently 0.5 deg tilt at block 1 and 6.5 deg tilt at block 48.



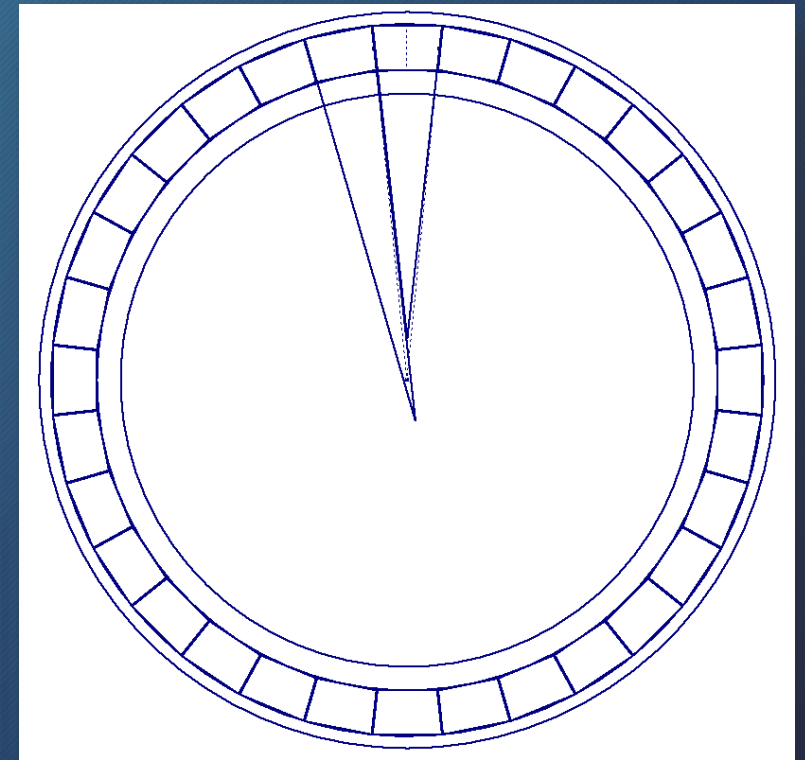
EMCal “Blocks” Focus

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Tilt



Alternating

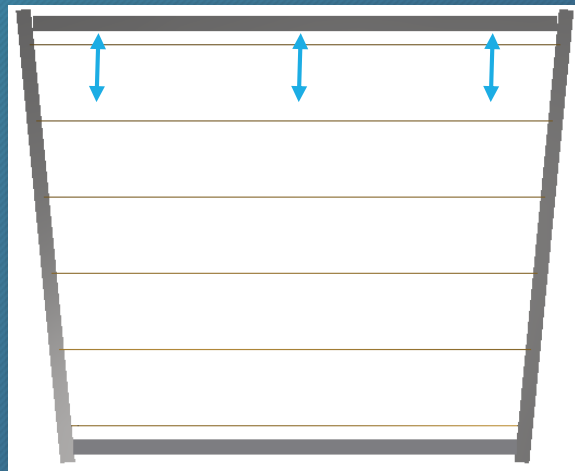
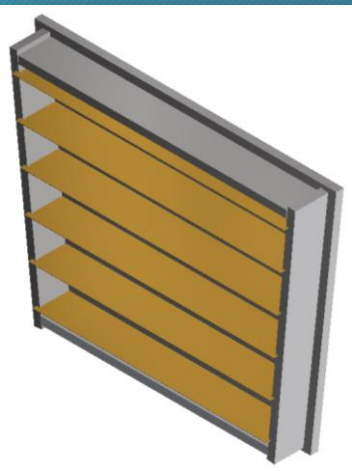


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EMCal “Block” Machining

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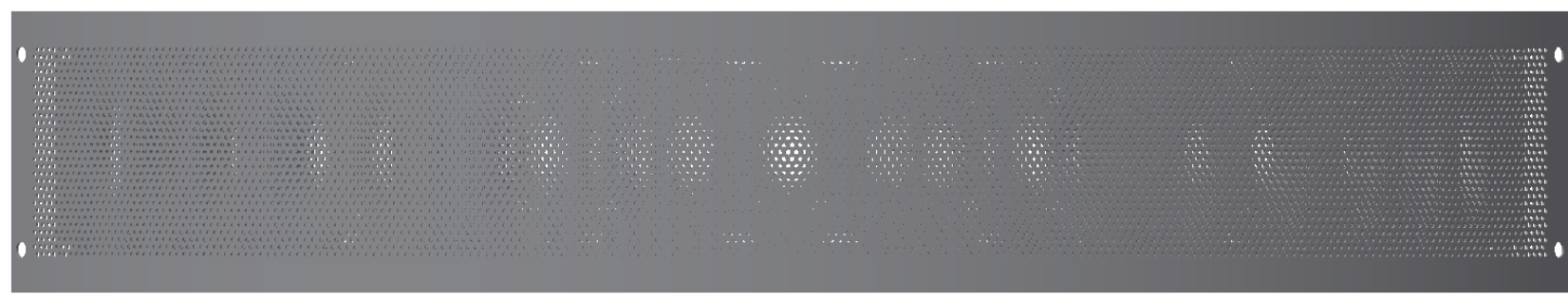
- One or a few cast shapes.
- Machine to length and sides to angle.
- In order to machine angle, may need a universal vice or custom jig.



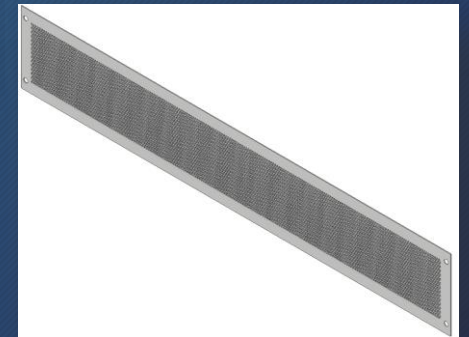
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EMCal “Block” Screens

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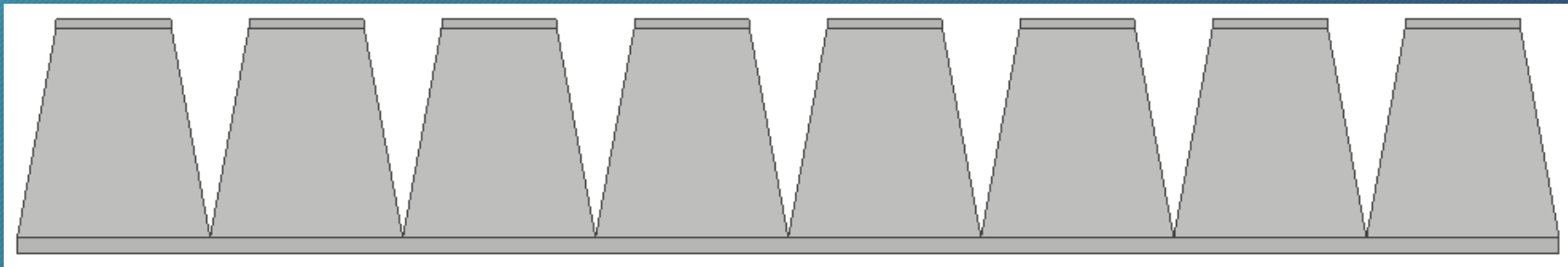


- Bend Screens to radius of about 4 in.
- Fibers go straight through when perpendicular to the tangent plane of the curve.
- Unbend screens.

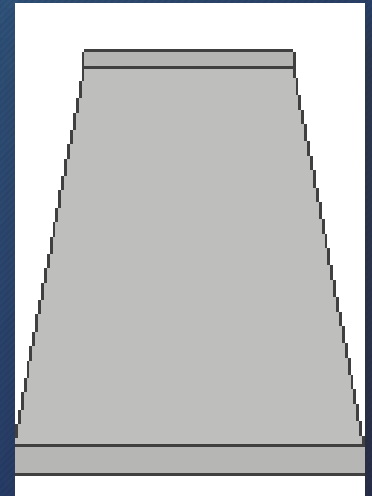
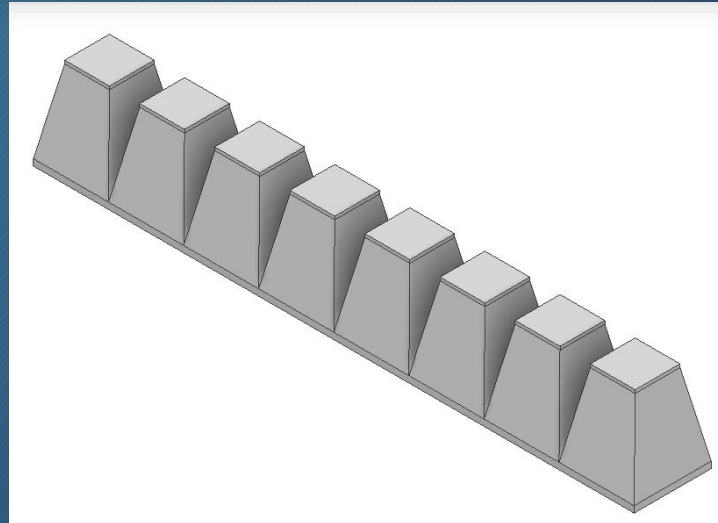


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EMCal “Block” Light Guides



- One 1X8 light guide or one 1X1. Need to be machined.
- Otherwise 48 1X8 light guides or 49 1X1 light guides. However, maybe one design can be used for multiple blocks.



EMCal Design Advantages and Disadvantages

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Advantages:

- One type of cast or “Block” (maybe more).
- 6 types of screens (maybe more).
- One type of light guide (maybe more).
- One type of daughterboard (maybe more or maybe none?).
- Flat bracket mounting surface.
- Potently easy fiber threading.
- Potently easy epoxy filling.
- No φ block gap.
- Same sheet metal box (skin) design

Disadvantages:

- 48 different machined shapes.
- Waisted material.
- Twice ϑ block gap.
- Increased gap between sectors.
- Things to note:
- No singular sector focal point.
- Cost?